

REMARKS

The claims now pending in the application are Claims 1 to 11. The independent claims being Claims 1 and 11. Claims 1 to 11 have been amended.

In the Official Action dated February 28, 2001, Claims 1 and 11 were rejected under 35 U.S.C. § 103(a), as unpatentable over Figure 1 and the corresponding disclosure at pages 2 to 5 of the present application (Applicants' "Admitted Prior Art"), in view of U.S. Patent No. 5,700,103 (Tsai) and U.S. Patent No. 4,105,282 (Schael). Reconsideration and withdrawal of the rejection respectfully are requested in view of the above amendments and the following remarks.

Initially, the specification has been reviewed and amended herein to improve its form, including formal amendments to conform the written disclosure and the drawings, as previously requested by the Examiner. Support for the proposed amendments may be found in the original application. No new matter has been added.

The rejection of the claims over the cited art respectfully is traversed. In each aspect (Claims 1 and 11), the claimed invention is directed to an optical-element holding mechanism including a coupling mechanism for securely

coupling two holding members while accurately performing alignment of the optical axes of the two optical elements. As disclosed in greater detail in the present application, the novel arrangement of locating an urging member (e.g., spring washer 120) between a coupling member (e.g., screw 145) and a second holding member (e.g., sixth lens unit holding frame 118), that is, on the side of the first holding member opposite the side contacting the second holding member, provides a significant improvement over prior art coupling structures in precision during assembly. Compare, Figure 3 with Figure 1.

Applicants submit that the prior art fails to anticipate the present invention. Moreover, Applicants submit that there are differences between the subject matter sought to be patented and the prior art, such that the subject matter taken as a whole would not have been obvious at the time the invention was made to one of ordinary skill in the art.

Figure 1 of the subject application discloses a system including a first lens tube 3, which holds a first lens 5, a second lens tube 6, which holds a second lens 7, and a coupling member (screw) 9. However, as acknowledged in the Official Action, the conventional structure illustrated

in Figure 1 of the subject application fails to disclose or suggest at least the above recited features of the present invention. Nowhere does the Figure 1 system disclose or suggest the use of an urging member located between a coupling member and the second holding member, as disclosed and claimed in the subject application. Rather, in Figure 1, a composite member 8 (including elements 8a, 8b, 8c), is disposed remote from the coupling member 9 during alignment/assembly of the first and second optical holding elements.

The Tsai '103 patent relates to a mounting structure, and discloses a mounting structure including a locking plate disposed between a mount and a frame structure. However, Applicants submit that the Tsai '103 patent fails to disclose or suggest at least the above-described features of the present invention. Rather, the Tsai '102 patent teaches an arrangement locating locking plate 10, including elastic member 11, between the contacting surfaces of the first and second mounting members (mount B and frame structure C). This is an arrangement which Applicants have avoided, so as to overcome a drawback of such structure; such structure has a drawback in that it prevents direct contact between the surfaces of the two mount members (B,C) and introduces a variable height element that can exacerbate the difficulty of

achieving precision contact and location, thereby preventing precise alignment of the two optical axes. Not surprisingly, nowhere does the Tsai '103 patent disclose or suggest alignment of the optical axes of two optical elements. Accordingly, Applicants submit that the Tsai '103 patent fails to add anything to the disclosure of Figure 1 and the corresponding text of the present application that would make obvious the claimed invention.

The Schael '282 patent relates to an optical sight, and discloses an optical sighting device for firearms. However, Applicants submit that the Schael '282 patent fails to disclose or suggest at least the above-discussed features of the present invention. Similar to the Tsai '103 patent, the Schael '282 patent discloses an arrangement including an elastic element (flat springs 13,14,15) located between a support ring 16 and a cylindrical barrel 11. Applicants submit that such structure suffers the same drawback as the structure of the Tsai '103 patent; Applicants submit that it would be impossible to tighten/torque screws 23,24,25 so as to precisely position/locate the support ring 16 and cylindrical barrel 11 relative to optical axes. Nor is the Schael '282 patent believed to add anything the above-discussed art that would make obvious the claimed invention.

For the above reasons, Applicants submit that independent Claims 1 and 11, are allowable over the cited art.

Claims 2 to 10 depend from Claim 1, and are believed allowable for the same reasons. Moreover, each of these dependent claims recites additional features in combination with the features of base Claim 1, and is believed allowable in its own right. Individual consideration of the dependent claims respectfully is requested.

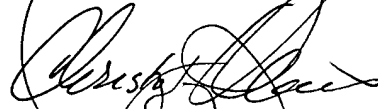
Applicants request that the present Amendment be entered under 37 CFR 1.116. Applicants submit that the present amendments to the specification merely are formal in nature, and that the present amendments and remarks reduce the number of issues for consideration and place the application in condition for allowance. Applicants submit that the present remarks were necessitated by the new rejection put forth in the Official Action.

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submit that the application is in allowable form. Favorable consideration of the claims and

passage to issue of the present application at the Examiner's earliest convenience earnestly are solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Attorney for Applicants

Registration No. 32,078

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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Application No. 09/236,339
Attorney Docket No. 865.4327

VERSION WITH MARKS TO SHOW CHANGES MADE TO SPECIFICATION

Please substitute the paragraph starting at page 6, line 15, and ending at line 20, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Meanwhile, cameras are arranged nowadays to automatically perform all actions important for photo-taking, such as determining an exposure, focus adjustment, etc. Even a person who is unaccustomed to operating [operate] cameras, therefore, can take photographs with little possibility of failure.--

Please substitute the paragraph starting at page 6, line 26, and ending at page 7, line 6 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Here, the system for correcting image shakes resulting from vibrations is briefly described. In taking

photographs, the hands holding the camera generally vibrate within a frequency range from 1 Hz to 12 Hz. In order to take a photograph without any image shake despite [of] such vibrations at the time of a shutter release, it is a basic concept to detect the vibration of the camera and then to vary the position of a correction lens according to the value of the vibration detected.--

Please substitute the paragraph starting at page 7, line 23 and ending at page 8, line 3, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--An image-shake correcting system which uses such a vibration detecting means is next described in outline. Fig. 2 shows by way of example the arrangement of the image-shake correcting system. In the case of the system shown in Fig. 2, the system is arranged to suppress [an] image shake [shakes] of the camera taking place in the directions of arrow 81_x including a vertical vibration 81_y (direction of pitch) and a horizontal direction 81_y (direction of yaw).--

Please substitute the paragraph starting at page 8, line 27 and ending at page 8, line 4 with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--However, the conventional image-shake correcting device is arranged to be secured to a fixed member within an optical apparatus and to be immovable in the direction of the optical axis in many cases. Such an arrangement has imposed some limitation on the optical design of the apparatus.--

Please substitute the paragraph starting at page 10, line 22 and ending at page 11, line 2, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The optical-element holding mechanism is preferably arranged to prevent deterioration of accuracy of correction of an optical axis deviation resulting from deformation of the first holding member by mounting a deformation restricting member arranged to restrict the deformation of

the first holding member taking place in varying the relative positions of the first and second holding members and also when the coupling member is in the process of coupling the first and second holding members.--

Please substitute the paragraph starting at page 21, line 1 and ending at page 21, line 5, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The interchangeable lens is thus arranged to allow the second lens unit L2 to move back and forth in the direction of the optical axis by mechanically correcting a focal position deviation caused by a change of focal length occurring [occurred] in a state of inner focus.--

Please substitute the paragraph starting at page 24, line 17, and ending at page 24, line 26, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Next, the optical axis deviation of the lens holding mechanism according to the first embodiment is corrected while the mechanism is in a state in which each of the screws 145 is tightened halfway, i.e., while the sixth lens unit holding frame 118 is not completely secured to the third lens unit holding frame 109, although the sixth lens unit holding frame 118 is being pushed against the third lens unit holding frame 109 by the spring force of the spring washer 120 (in the process of coupling).--

Please substitute the paragraph starting at page 28, line 27, and ending at page 29, line 12, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--As described above, the first embodiment is arranged to decide a spacing distance between the optical elements held by the first and second holding members by means of the urging force of an urging member disposed inside of the apparatus between a coupling member and the second holding member, while these optical elements are in the

process of correcting an optical axis deviation. Unlike the arrangement of the prior art described in the foregoing, the arrangement of the first embodiment permits accurate correction of the optical axis deviation, without causing any part to be deformed by an urging force of an adjustment tool applied from outside of the apparatus.--

Please substitute the paragraph starting at page 31, line 6, and ending at page 31, line 12, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Sliding pins [pin] 307 are arranged to be press-fitted through the sliding cams 302a into holes 301a which are formed in the holding frame 301 at three parts. The holding frame 301 has its position relative to the base plate 302 restricted in the direction of the optical axis but is arranged to be movable in all directions on the plane orthogonally intersecting the optical axis.--

Please substitute the paragraph starting at page 43, line 24, and ending at page 44, line 13, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--With the zoom operation ring 202 rotated, a lead groove formed on the inner side of the zoom operation ring 202 causes an intermediate tube 231 to move back and forth in the direction of the optical axis. Then, the first lens unit L1 also moves back and forth in the direction of the optical axis together with the filter frame 201 which engages a cam groove formed in the inner side of the intermediate tube 231. Reference numeral 220 denotes the image-shake correcting device described in the foregoing. The image-shake correcting device 220 is connected to a main circuit board 215 through the flexible circuit board 310 shown in Fig. 5. Reference numeral 206 denotes a focusing unit. The focusing unit 206 is connected to the main circuit board 216 [215] and is thus arranged to perform a focus adjustment driving action. This lens barrel is provided with a manual

(operation) ring 221 which is arranged to permit [a] manual focusing by operating it.--

Please substitute the paragraph starting at page 45 line 15, and ending at page 45, line 25, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The outer diameter of the third lens unit holding tube 217 is equal to that of the image-shake correcting device 220. Both the third lens unit holding tube 217 and the image-shake correcting device 220 are slidably fitted inside the guide tube 228. In other words, the outer diameter of the lens barrel does not increase despite the arrangement which interlinks the lens tubes 217 and 214 disposed before and after the image-shake correcting device 220 [202]. Therefore, the size of the lens barrel in the direction of its diameter can be effectively prevented from being increased.--

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